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10/790,889	03/01/2004	Mary Morabito O'Neill	03W124	2628

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EXAMINER	
WYATT, KEVIN S	

ART UNIT	PAPER NUMBER
2878	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/790,889	O'NEILL ET AL.	
	Examiner	Art Unit	
	Kevin Wyatt	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 March 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,11-15 and 17-21* is/are rejected.

7)☒ Claim(s) *6-10 and 16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to the Amendment after non-final and remarks filed on 03/02/2007. Currently, claims 1-21 are pending.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 17-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Hou (U.S. Patent No. 6,596,979 B2).

Regarding claim 17, Hou shows in Figs. 2A-2B, 3 and 10, a method for locating a position of a feature in a scene, comprising the steps of forming an image of the feature using a segmented array having a plurality of array subelements, wherein each of the array subelements has an output signal (col. 5, lines 27-35); and cooperatively analyzing the output signals from at least two spatially adjacent array subelements to establish a data set reflective of an extent to which output signals responsive to the image of the feature are produced from exactly one or from more than one of the adjacent array subelements (col. 5, lines 48-57), and to reach a conclusion from the data set as to a location of the image of the feature on the segmented array (col. 5, lines 57-60).

Regarding claim 18, Hou shows in Fig. 10 a method wherein the step of

providing a sensor includes the step of providing a one-dimensional segmented array having spatially overlapping array subelements.

Regarding claim 19, Hou shows in Fig. 10 a method wherein the step of providing a sensor includes the step of providing a two-dimensional segmented array formed of a pattern of intersecting array subelements.

Regarding claim 20, Hou further shows in Figs. 9A-9B, a method wherein the step of providing a sensor includes the step of providing a two-dimensional segmented array formed of a pattern of square array subelements, wherein four of the square array subelements meet at an intersection point (col. 9, lines 21-24), and wherein the step of forming an image includes the step of forming the image having a diameter of one blur diameter.

Regarding claim 21, Hou further shows in Fig. 10, that each detector subelement overlaps each of two adjacent detector subelements along their lengths by an amount that is responsive to the blur diameter.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-4 and 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hou (U.S. Patent No. 6,596,979 B2) in view of Coufal (Publication No. U.S. 2003/0053221 A1).

Regarding claim 1, Hou shows in Figs. 2-3 and 10, an imaging sensor system comprising an optics system that images a point feature (960, 968 and 970, i.e. scanning dots) of a scene at an image plane; and a detector array (950, i.e. image sensor) at the image plane, wherein the detector array is a one-dimensional detector array comprising a plurality of detector subelements (962-967, i.e. photodetectors) each having a width of from about 1/2 to about 5 blur diameters (1 blur diameter is equivalent to from approximately the area of a single detector to approximately 1/2 the area of 3 adjacent detectors according to col. 10, lines 12-18), and a length of n blur diameters (n is approximately equal to the width of the detector if detector is approximately square), wherein each detector subelement overlaps each of two adjacent detector subelements along their lengths, wherein an overlap of each of the two adjacent detector subelements is m blur diameters (shifted alternatively by a distance (D) and (D) is in general, preferably 1/2 size of a photodetector, col. 9, lines 59-60) and a center-to-center spacing of each of the two adjacent detector subelements is n_O blur diameters (or 2D), and wherein n is equal to about 3m and m is equal to about $n_O/2$ (col. 9, lines 59-60 implies that a tolerance of plus or minus D may fall within these measurements). Hou does not explicitly disclose that the optics system that images a point feature of a scene at an image plane as a blur-circle image having a blur diameter. Coufal discloses that the optics system that images a point feature of a scene at an image plane as a

blur-circle image having a blur diameter based on its optics system (paragraph 0089, lines 1-4). It would have been obvious to one skilled in the art to provide an optics system such as the one disclosed in Coufal to the device of Hou for the purpose of addressing the degree of imperfections of optical systems which lead to distortions of a scene imaged by an optical system.

Regarding claim 2, Hou discloses that the detector subelements each have a width of about 1 blur diameter (1 blur diameter corresponds to the area of a single detector to approximately 1/2 the area of 3 adjacent detectors according to col. 10, lines 12-18).

Regarding claim 3, Hou further discloses that n lies in a range of from about (3m - 2) to about (3m + 2), and m lies in a range of from about (n_O/2 - 1) to from (n_O/2 + 1)(according to claim 1, if D corresponds to m, and 3D corresponds to n, then both m and n fall within the recited ranges).

Regarding claim 4, Hou further discloses that n lies in a range of from (3m - 2) to (3m + 2), and m lies in a range of from (n_O/2 - 1) to (n_O/2 + 1)(according to claim 1, if D corresponds to m, and 3D corresponds to n, then both m and n fall within the recited ranges).

Regarding claim 11, Hou further discloses a scanning mechanism that scans the one-dimensional detector array in a scanning direction perpendicular to the length of the detector subelements (col. 5, lines 39-42).

Regarding claim 12, Hou further discloses a scanning mechanism that includes a moving platform upon which the one-dimensional detector array is mounted (col. 5, lines

39-42).

Regarding claim 13, Hou shows in Figs. 2A and 10, an imaging sensor system comprising an optics system (208, i.e., rod lens array) that images a point feature of a scene at an image plane having a blur diameter (960, 968, 970, i.e., scanning dots); and a detector array (250, photodetector array) at the image plane, wherein the detector array is a one dimensional detector array or a two-dimensional detector array comprising a plurality of detector subelements, and wherein the detector subelements are sized responsive to the blur diameter. Hou does not explicitly disclose that the optics system that images a point feature of a scene at an image plane as a blur-circle image having a blur diameter. Coufal discloses that the optics system that images a point feature of a scene at an image plane as a blur-circle image having a blur diameter based on its optics system (paragraph 0089, lines 1-4). It would have been obvious to one skilled in the art to provide an optics system such as the one disclosed in Coufal to the device of Hou for the purpose of addressing the degree of imperfections of optical systems which lead to distortions of a scene imaged by an optical system.

Regarding claim 14, Hou further shows in Fig. 10, the detector subelements are square in plan view (col. 6, lines 39-40).

Regarding claim 15, Hou shows in Fig. 10, the detector subelements are rectangular in plan view (col. 6, lines 39-40).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-5, are rejected under 35 U.S.C. 103(a) as being unpatentable over Carnall, Jr. (U.S. Patent No. 5,065,245) in view of Hou (U.S. Patent No. 6,596,979 B2) and Coufal (Publication No. U.S. 2003/0053221 A1).

Regarding claim 1, Carnall, Jr. shows in Fig. 1 an imaging sensor system (10, i.e., modular image sensor array) a detector array at the image plane, wherein the detector array is a one-dimensional detector array comprising a plurality of detector subelements each having a width of from about 1/2 to about 5 blur diameters, and a length of n blur diameters, wherein each detector subelement overlaps each of two adjacent detector subelements along their lengths, wherein an overlap of each of the two adjacent detector subelements is m blur diameters and a center-to-center spacing of each of the two adjacent detector subelements is n_o blur diameters, and wherein n is equal to about 3m and m is equal to about $n_o/2$. Carnall, Jr. does not disclose an optics system that images a point feature of a scene at an image plane as a blur-circle image having a blur diameter. Hou shows in Fig. 2B, an optics system (208, optical lens 274) having a blur diameter (col. 5, lines 27-33), and Coufal discloses imaging a point feature of a scene at an image plane as a blur-circle image (due to inherent imperfections of its optics system, paragraph 0028, lines 1-4). It would have been obvious to one skilled in the art to provide the optics system of Hou and the teachings of Coufal to the device of Carnall, Jr. for the purpose of providing a reliable

means of focusing and aligning image onto the photodetector array taking into account the realized imperfections of the optics system.

Regarding claims 2-5, Carnall, Jr. further discloses the claimed invention as stated above. In addition, Carnall, Jr. shows in Fig. 1 a) subelements each have a width of about 1 blur diameter; b) n lies in a range of from about (3m-2) to about (3m+2), and m lies in a range of from about (n_O/2-1) to about (n_O/2+1); c) n lies in a range from (3m-2) to (3m+2), and m lies in a range of from (n_O/2-1) to (n_O/2+1); and d) n is equal to 3m and m is equal to n_O/2. Carnall, Jr. does not disclose an optics system that images a point feature of a scene at an image plane as a blur-circle image having a blur diameter. Hou shows in Fig. 2B, a) an optics system (208, optical lens 274) that images a point feature of a scene at an image plane as a blur-circle image having a blur diameter (col. 5, lines 27-33). It would have been obvious to one skilled in the art to provide the optics system of Hou to the device of Carnall, Jr. for the purpose of providing a reliable means of focusing and aligning image onto the photodetector array.

Allowable Subject Matter

6. Claims 6-10 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter:

Claim 6, is allowable because the prior art fails to disclose or make obvious,

either singly or in combination, an imaging sensor system, comprising, in addition to the other recited features of the claim, detector subelements having a length of at least 20 times the detector width, and wherein n is substantially equal to 3m and m is substantially equal to $n_O/2$.

Claim 7 is allowable because the prior art fails to disclose or make obvious, either singly or in combination, an imaging sensor system, comprising, in addition to the other recited features of the claim, detector subelements wherein n is substantially equal to (3m-2) and m is substantially equal to ($n_O/2$-1).

Claim 8 is allowable because the prior art fails to disclose or make obvious, either singly or in combination, an imaging sensor system, comprising, in addition to the other recited features of the claim, detector subelements having a length of less than 20 times the detector width, and wherein n is substantially equal to (3m-2) and m is substantially equal to ($n_O/2$-1).

Claim 9 is allowable because the prior art fails to disclose or make obvious, either singly or in combination, an imaging sensor system, comprising, in addition to the other recited features of the claim, detector subelements wherein n is substantially equal to (3m+2) and m is substantially equal to ($n_O/2$+1).

Claim 10 is allowable because the prior art fails to disclose or make obvious, either singly or in combination, an imaging sensor system, comprising, in addition to the other recited features of the claim, detector subelements having a length of less than 20 times the detector width, and wherein n is substantially equal to (3m+2) and m is substantially equal to ($n_O/2$+1).

Claim 16 is allowable because the prior art fails to disclose or make obvious, either singly or in combination, an imaging sensor system, comprising, in addition to the other recited features of the claim, detector subelements having a lengthwise overlap of 1 blur diameter relative to a laterally adjacent detector subelement.

Response to Arguments

8. Applicant's arguments filed 03/02/2007 have been fully considered but they are not persuasive.

In response to applicant's arguments regarding claim 17, that nowhere in this discussion, or elsewhere in Hou, is there any mention of the concept of "produced from exactly one or from more than one" as recited in claim 17, that the hardware illustrated in Figures 2A-2B and 3 has no capability for determining whether an output signal responsive to the image is produced from exactly one or more than one adjacent array subelement, the examiner disagrees. According to col. 5, lines 27-35, 48-60, the hardware illustrated in Figures 2A-2B and 3, the image signal processing electronics (252) provides the determination particularly when (according to col. 5, lines 4-9) the image signals are read into a stream of captured image data for a particular color on a pixel line. This would reasonably suggest that determinations are made regarding signals of the already captured image data present in adjacent array subelements during image processing particularly with respect to colôr on each pixel line. In addition, due to the fact that the present invention of Hou (which is a scanning device) is used in

combination with a computing device (according to col. 4, lines 30-37) which would provide an additional means for determining whether an output signal responsive to the image is produced from exactly one or more than one adjacent array subelement by manipulating the captured image to produce desired visual effects with an appropriate computer program.

In response to applicant's arguments regarding claim 20, that Hou does not disclose the step of forming an image which includes the step of forming the image having a blur diameter of one blur diameter, that there is no mention of blur diameters or one blur diameter in the Figs. 9A-B and col. 9, lines 21-24 or elsewhere in Hou, the examiner disagrees. As stated in the previous Office Action, optics system in Hou will provide a degree of imperfection when imaging an object due to tolerances optics system in the device and limitations of the lens material. Therefore, the optics system would image a point feature of a scene having a blur due to this imperfection. The effect of the imperfection of an optics system is supported in the disclosure of Coufal in particularly in paragraph 0089, lines 1-4. Therefore, scanning dots (960, 968, and 970) would provide the "blur" and "blur diameter" in Hou (imprecisely focused) due to the imperfect optics system.

In response to applicant's arguments that there is set forth no objective basis for combining the teachings of the references in the manner used by the rejection, and selecting helpful portions from each reference while ignoring the unhelpful portions, that there is absolutely no reason to believe that light imaged from a scene such as Hou, is in the form of a beam having a Gaussian intensity distribution such as Coufal, the

examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the teachings in Coufal (paragraph 0089, lines 1-4) as it addresses the imperfect process inherent in fabricating lenses in optics systems would indicate that an optics system such as disclosed in Hou would have imperfection as well which would as least some degree of blurring of the point feature of a scene.

In response to applicant's arguments regarding claim 1 Hou does not implicitly disclose anything about blur diameters of the concept of blur diameters, that the discussion at col. 10, lines 12-18 is not related to blur diameter, there is not disclosure in Hou of "an optics system that images a point feature of a scene at an image plane as a blur circle image having a blur diameter, the examiner disagrees. As stated in the previous Office Action, optics system in Hou will provide a degree of imperfection when imaging an object due to tolerances optics system in the device and limitations of the lens material. Therefore, the optics system would image a point feature of a scene having a blur due to this imperfection. The effect of the imperfection of an optics system is supported in the disclosure of Coufal in particularly in paragraph 0089, lines 1-4. Therefore, scanning dots (960, 968, and 970) would provide the "blur" and "blur diameter" in Hou (imprecisely focused) due to the imperfect optics system.

In response to applicant's arguments regarding claim 1, that the detector disclosed in Hou is not a one-dimensional array, the examiner disagrees. Hou's invention relates to a scanner which in col. 1, lines 57-59 and col. 2, lines 12-13, Hou indicates that scanners are employed as one-dimensional arrays.

In response to applicant's arguments that Hou presents no concept of the size of photodetectors in relation to a blurred point image. The relationships or blur diameters can be derived from the size relationships disclosed in col. 9, lines 59-61 along with the teachings disclosed in Coufal in 0089, lines 1-4.

In response to applicant's arguments regarding claim 1, that the optics system that images a point feature of a scene at an image plane as a blur-circle image having a blur diameter based on its optics system is not a correct statement of what Coufal teaches, the examiner disagrees. Paragraph 0089, lines 1-4 in Coufal addresses the imperfect fabrication process of lenses producing an optics system which is less than perfect which would lead to a point feature of a scene from an optics system having a "blur-circle image."

In response to applicant's arguments regarding claims 2-4, that Hou does not mention the recited relationships or a blur diameter in any manner nor is there any teaching in the references like that stated in the explanation of the rejection. The relationships or blur diameters can be derived from the size relationships disclosed in col. 9, lines 59-61 along with the teachings disclosed in Coufal in 0089, lines 1-4.

In response to applicant's arguments regarding claim 13 that Hou does not disclose a blur diameter, or disclose or suggest that the photodiodes are sized in any

manner responsive to a blur diameter. The relationships or blur diameters can be derived from the size relationships disclosed in col. 9, lines 59-61 along with the teachings disclosed in Coufal in 0089, lines 1-4.

In response to applicant's arguments regarding claim 1 that no location is referenced for the assertion of "providing a reliable means for focusing and aligning image onto the photodetector array," the examiner disagrees. Support for this assertion can at least be found in col. 4, lines 61-66.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Wyatt whose telephone number is (571)-272-5974. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Georgia Epps can be reached on (571)-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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